

Status of the Development and Deployment of the NCSP Training and Education Courses for FY18

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Pantex Plant
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ORNL is managed by UT-Battelle, LLC for the US Department of Energy

Agenda

- NCSP T&E Mission and Vision
- Course objectives and offerings
- Two-week hands-on course update
- One-week hands-on course update
- Plans for a new CSO course
- Course statistics



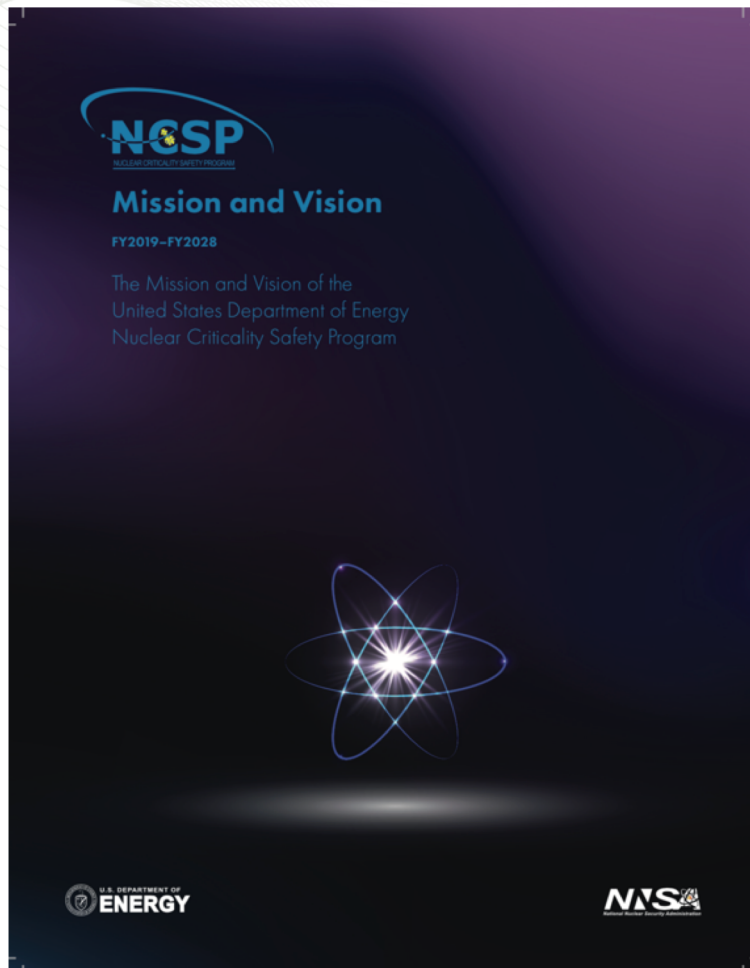
US DOE Nuclear Criticality Safety Program (NCSP) T&E Course Mission & Vision

T&E Course Mission

- *The T&E program element will continue to **identify, develop, and facilitate** training needs and educational resources, including hands-on training with fissionable material systems, in areas where no suitable alternative exists*
- **Primary purpose:** *to maintain and enhance the technical abilities and knowledge of those who impact or are impacted directly by the practice of criticality safety*
 - *This includes training and education of people entering the criticality safety discipline from related scientific fields, as well as maintaining and enhancing competency levels of those already in the community*

T&E Course Vision

- *This NCSP element will identify, **develop, provide, and promote** practical and excellent technical training and educational resources that help ensure competency in the art, science and implementation of nuclear criticality safety and is adaptable and responsive to the needs of those responsible for developing, implementing, and maintaining criticality safety.*



NCSP T&E Course Offerings

NCSP Training and Education Courses

Development begins in mid-FY19 based on CSSG tasking report 2018-1

Hands-On Course
(2 weeks)

Manager Course
(1 week)

Special Courses
(1 week)

Criticality Safety Officer Course
(1 week)

Week 1

Classroom Training

Sandia

NCERC

NCERC

Sandia

NCERC

Week 2

Hands-On Training
NCERC

Hands-On Training
Sandia

Upcoming Course Dates:

- Apr 8 - 12, 2019
- Jun 3 - 7, 2019

Last course held in 2015 for AWE

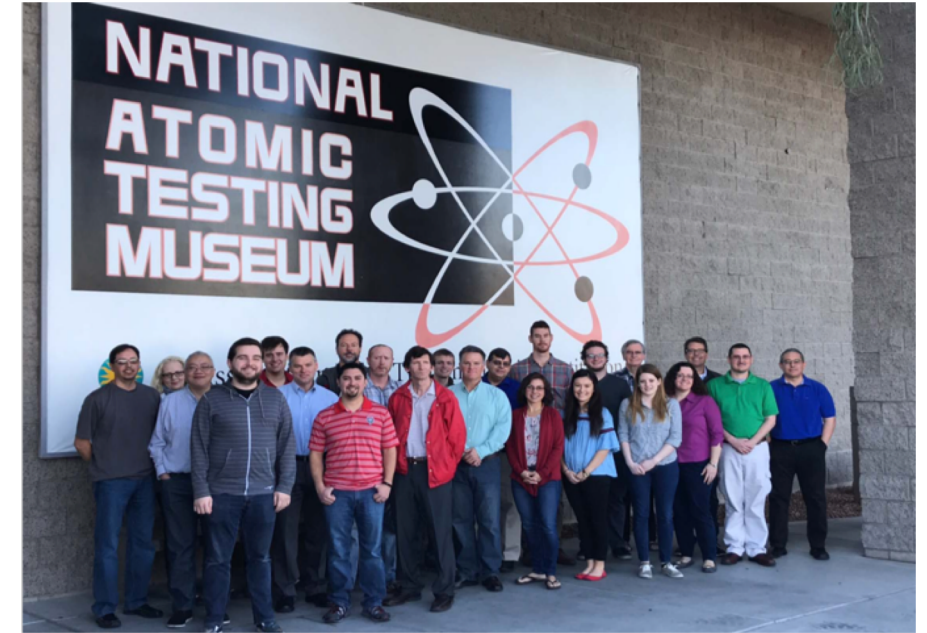
Upcoming Course Dates:

- Aug 12 - 23, 2019
- Jan 27 - Feb 7, 2020

- National Criticality Experiments Research Center (NCERC)
- Nevada Field Office (NFO)
- National Atomic Testing Museum (NATM)

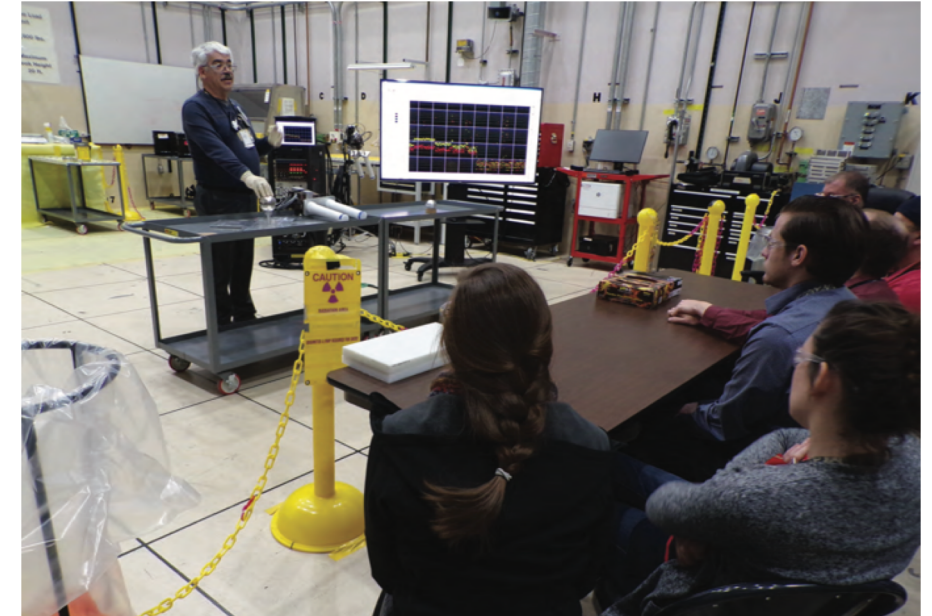
Two-week hands-on course: Week 1 – classroom portion

- DOE requirements, national standards, and DOE NCSP
- Processing criticality accident lessons-learned
- NCS fundamentals
- ANSI/ANS-8 consensus standards
- Single unit and array hand calculation methods
- NCSE workshops
- Human factors and reliability principles for NCS evaluations
- Nondestructive assay (NDA) – interpretation and application of NDA methods and results to NCSEs
- Validation of computational methods
- Daily homework and quizzes
- Passing requirement: overall grade of 80%



Two-week hands-on course: Week 2, hands-on portion

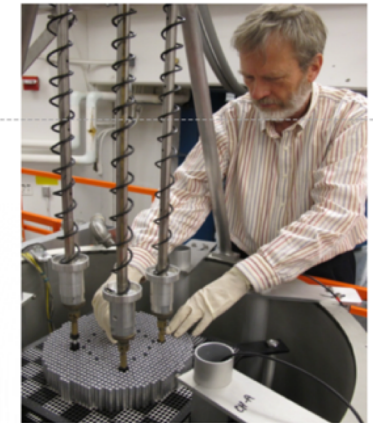
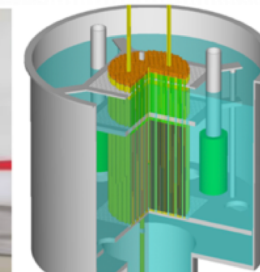
- Overview of Sandia and NCERC facilities and assemblies
- Overview of the experiment procedures and methodology
- Neutron dynamics fundamentals and subcritical multiplication
- Nuclear instrumentation
- ANSI/ANS-1 *Conduct of Critical Experiments*
- Lessons learned from experimental criticality accidents
- Subcritical and critical experiments
 - NCERC – operations with Planet, Flattop, Godiva IV, BeRP Ball, ^{237}Np Sphere, and Training Assembly for Criticality Safety (TACS)
 - Sandia – Seven percent critical experiment (7uPCX), Annular Core Research Reactor Core (ACRR) burst
- Critical experiments and the International Criticality Safety Benchmark Evaluation Project (ICSBEP) handbook
- Passing requirement: overall grade of 80%



One-week manager course

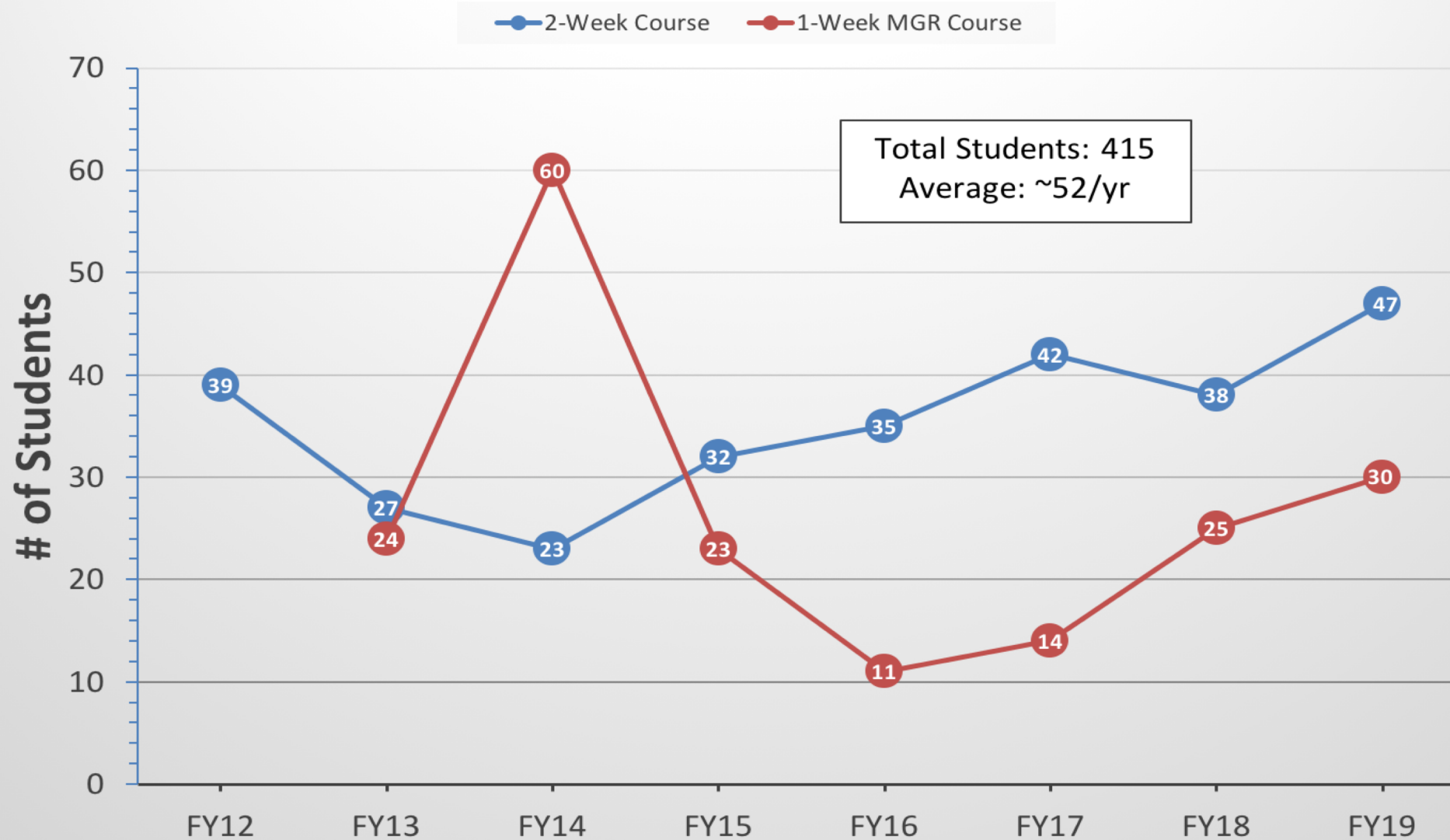
Focus: understanding the student's role in an NCS program

- DOE requirements, national standards, and the DOE NCSP
- Overview of Sandia and NCERC facilities, assemblies, and experiment procedures and methodology
- Neutron dynamics fundamentals and subcritical multiplication
- Nuclear instrumentation; conduct of operations
- ANSI/ANS-1 & 8 consensus standards
- NCSEs
- Lessons learned from criticality accidents
- Subcritical and critical experiments
 - NCERC – Ops with Planet, Flattop, Godiva IV, BeRP Ball, ^{237}Np Sphere, and Training Assembly for Criticality Safety (TACS)
 - Sandia – Seven percent critical experiment (7uPCX), Annular Core Research Reactor Core (ACRR) burst
- Passing requirement: overall grade of 80%



Course Statistics

NCSP T&E Courses - Total Number of Students Trained FY12-FY19



FY2019
Data is
based on
current
registration
data

Acknowledgements

Registration & Badging

- Becka Hudson (LLNL)
- Sue Ziehm (LANL) – DAF Badging
- Brooke DeWane (LLNL) – NFO Badging
- Chuck Lee (LLNL)

National Atomic Testing Museum

- Grant Bowler

NFO/NATM

- Lori Scott (ORNL)
- Charlotte Carter (NFO)
- Kevin Breen (NFO)
- Cliff Washington (NFO)
- Doug Bowen (ORNL)
- Steve Clement (LANL)
- Jeff Lewis (NSTec)
- Cyle Everson (NFO)
- Catherine Percher (LLNL)
- Jeff Chapman (ORNL)
- Nicole Murchinson (SNL)
- Jerry Hicks (NNSA Ret.)
- Bob Wilson (DOE EM)
- Don Mueller (ORNL)
- B.J. Marshall (ORNL)
- Susan Stevens-Adams (SNL)
- Chris Haught (Y-12)
- Angie Lousteau (ORNL)

LANL

- Jen Alwin (LANL)
- Theresa Cutler (LANL)
- Doug Bowen (ORNL)
- Shean Monahan (SNL)
- Mark Mitchell (LANL)
- Susan Stevens-Adams (SNL)
- Jeff Chapman (ORNL)
- Jerry Hicks (NNSA Ret.)

Sandia

- Mary Ellen Ratzer (SNL)
- Gary Harms (SNL)
- John Ford (SNL)
- Shean Monahan (SNL)
- Ron Knief (SNL)
- John Miller (SNL)
- Nancy Ford (SNL)
- Kerstan Cole (SNL)
- Eric Moyer (SNL)
- Rafe Campbell (SNL)
- Jerry Hicks (NNSA Ret.)
- Bob Busch (UNM)

NCERC

- Jen Alwin (LANL)
- Theresa Cutler (LANL)
- Jeff Lewis (NSTec)
- Shean Monahan (SNL)
- Mark Mitchell (LANL)
- Jessie Walker (LANL)
- Susan Stevens-Adams (SNL)
- Jerry Hicks (NNSA Ret.)
- Dave Hayes (LANL)
- Bill Myers (LANL)
- Catherine Percher (LLNL)
- Rene Sanchez (LANL)
- Joetta Goda (LANL)
- Jesson Hutchinson (LANL)
- John Bounds (LANL)
- Travis Grove (LANL)

In addition:

- RCTs, Fire watchers, escorts, ACRR operators, badge office personnel, fissile material handlers, and numerous facility support personnel
- CSSG reviewers: Calvin Hopper, Mikey Brady-Rapp, Fitz Trumble, and Kevin Kimball





Questions?

